



**US Army Corps
of Engineers®**

Engineer Research and
Development Center

Modular Azimuth Position System (MAPS) Hybrid (MAPSH)

Description and Background:

The Modular Azimuth Position System (MAPS) Hybrid (MAPSH) is a Materiel Change to the MAPS. The MAPSH Program is the integration of MAPS Dynamic Reference Unit (DRU) and the Precision Lightweight GPS Receiver (PLGR). PLGR will aid the MAPS by providing the initial starting position for the MAPS normal alignment procedure, provide damping of inertial errors, and the added capability of aligning on the move. The MAPSH provides improved position and orientation autonomy, improves response time for fire missions, more accurate delivery of steel on target and improves acquisition of target location. The improved autonomy results from the MAPSH host system not having to depend on outside survey support. The MAPSH integration design allows MAPS or PLGR to be operated independently. The design allows continued navigation capability in the event MAPS or PLGR fails to operate.

Key Capabilities:

The integration of MAPS with PLGR provides the capabilities listed below. When the integrated capability is lost due to MAPS failure, PLGR failure, or operator action, the navigation accuracy is that of the functioning unit.

- Autonomous operation for host system - With PLGR operating and capable of receiving GPS satellite signals, PLGR will provide initializing coordinates for MAPS thus removing the need for an established survey control point.
- Align-on-the-move - With PLGR operating and capable of receiving GPS satellite signals, PLGR will provide information to MAPS to allow alignment while the host system is moving. (Currently MAPS requires the host system to be stationary for 8 - 15 minutes to perform normal alignment).
- Provides accurate position and orientation information to the host system (10 meter Horizontal, 10 meter Vertical, 0.67 mil Azimuth, 0.34 mil Pitch and Roll).
- Provides "Shoot & Scoot" capability for Paladin (ready to fire in less than 2 minutes verses the current 10 - 20 minutes for non-Paladin howitzers).
- PLGR provides redundant navigation capability.
- PLGR provides very accurate time.

Current Status: A MAPSH development contract was award to Honeywell, St. Petersburg, Fla. Honeywell is responsible for integrating the MAPS and PLGR. Honeywell is also responsible for designing the mounting arrangement for the identified host systems (Paladin, FIREFINDER, HMMWV). Hardware has completed Engineer Development Test (EDT). Government Qualification Testing with the final release of software was completed in 1st Qtr FY 96. Performance is well within specification. The transition to host system is on going. TEC continues to support incorporation of MAPSH into Automatic Fire Control System (AFCS) as AFCS software upgrades are introduced and tested. TEC is also supporting Paladin production and fielding addressing navigation subsystem operation and hardware problems that are discovered by soldiers. TEC is supporting an upgrade to the AFCS display unit, the Enhanced Display Unit. TEC members also represent Paladin for GPS integration, FBCB2, and other digitization programs.

Program Management: The MAPSH is managed by Product Manager, 155mm Howitzer, M109A6, Paladin (PM, Paladin). TEC provides technical support and management to PM, Paladin.

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